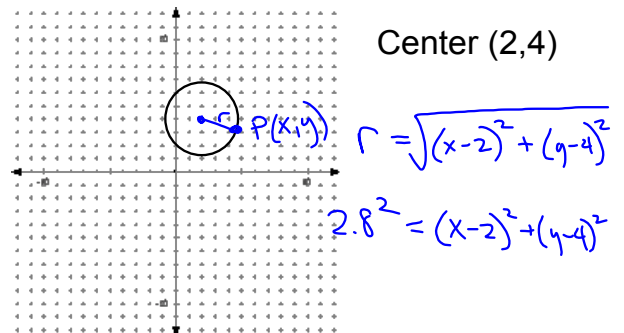


# 10-8 Equations of Circles



$$r^2 = (x-h)^2 + (y-k)^2$$

$r \rightarrow$  radius  
 $C(h, k)$

Write the equation of a circle with:  
C(3, -3) and d = 12

pm.

$$r = 6$$

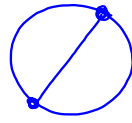
$$r^2 = (x-h)^2 + (y-k)^2$$

$$36 = (x-3)^2 + (y+3)^2$$

Write the equation of a circle with:  
C(-12, -1) and  $r = 8$

$$64 = (x+12)^2 + (y+1)^2$$

Write the equation of a circle with:  
Diameter endpoints(-3, -2) and (9, 4)



Use midpt to find the center

$$M\left(\frac{-3+9}{2}, \frac{-2+4}{2}\right) \quad M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

$$C(3, 1)$$

$$r^2 = (x-3)^2 + (y-1)^2$$

Plug in one endpt to find r.

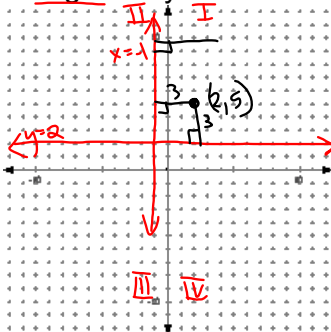
$$r^2 = (9-3)^2 + (4-1)^2$$

$$r^2 = 45 \quad 36 + 9$$

$$45 = (x-3)^2 + (y-1)^2$$

Write the equation of a circle with:

- Center in quadrant I
- $d = 6$   $r = 3$
- tangent to  $y = 2$  and  $x = -1$



$$x = -1 + 3 = 2$$

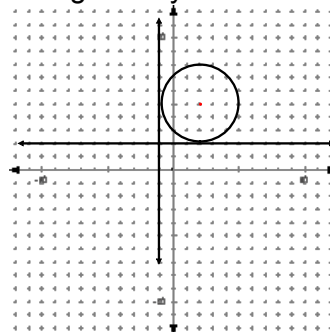
$$C(2, 5)$$

$$y = 2 + 3$$

$$9 = (x-2)^2 + (y-5)^2$$

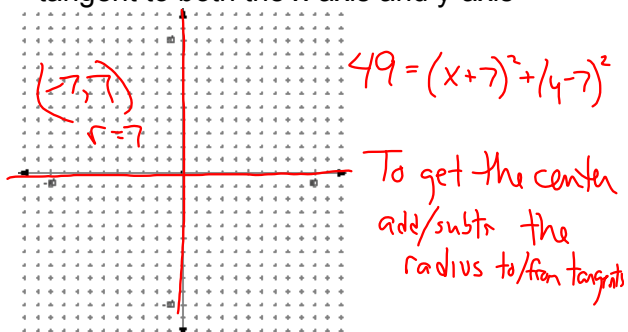
Write the equation of a circle with:

- Center in quadrant I
- $d = 6$
- tangent to  $y = 2$  and  $x = -1$



Write the equation of a circle with:

- Center in quadrant II
- $r = 7$
- tangent to both the x-axis and y-axis



Write the equation of a circle with:

$C(4, 2)$  and a point on the circle  $(8, -1)$

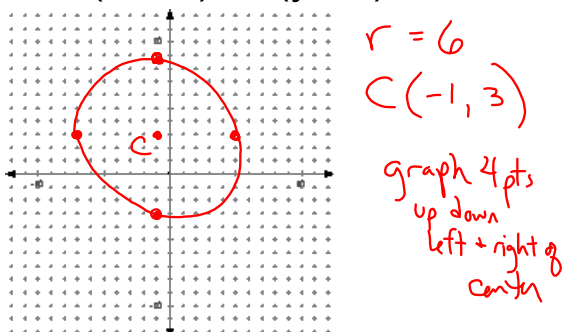
$$r^2 = (x-4)^2 + (y-2)^2$$

Plug in point

$$25 = (x-4)^2 + (y-2)^2$$

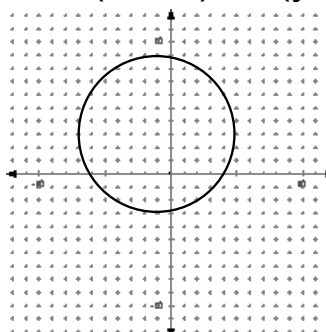
Graph the following circle:

$$36 = (x + 1)^2 + (y - 3)^2$$



Graph the following circle:

$$36 = (x + 1)^2 + (y - 3)^2$$



$$x^2 + y^2 = 16$$

What is the center?

$(0, 0)$

What is the radius?

4

HW

p578

14, 16-20, 23, 24, 28, 32

Write an equation for each circle.

14. center at  $(5, 10)$ ,  $r = 7$

16. center at  $(-8, 8)$ ,  $d = 16$

17. center at  $(-3, -10)$ ,  $d = 24$

18. a circle with center at  $(-3, 6)$  and a radius with endpoint at  $(0, 6)$

19. a circle with a diameter that has endpoints at  $(2, -2)$  and  $(-2, 2)$

20. a circle with a diameter that has endpoints at  $(-7, -2)$  and  $(-15, 6)$

23. a circle with its center in quadrant I, radius of 5 units, and tangents  $x = 2$  and  $y = 3$

Graph each equation.

24.  $x^2 + y^2 = 25$

28.  $(x - 2)^2 + (y - 1)^2 = 4$

32. Find the radius of a circle with equation  $(x - 2)^2 + (y - 2)^2 = r^2$  that contains the point at  $(2, 5)$ .